Annual Industrial Capabilities Report

to

Congress

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Abstract

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Foreword

It is the challenge of today's policymakers to help shape an industrial base that will supply 21st century warriors as effectively as it has supplied prior generations of American men and women in uniform.

Some observers have expressed concern about the allegedly excessive narrowing of the defense industrial base. The Department of Defense (D0D) believes that consolidation was a normal market response to reduced demand, driven by the post-Cold War defense budget drawdown of the 1990s. However, the Department also thinks that this "narrowing" is a sign of the current watershed between platform-centered and futuristic warfare concepts. The Department believes that transformational warfighting capabilities will spawn a transformed industry, including transformed prime contractors, emerging innovative defense suppliers, and commercial companies (or divisions of such companies) that form around new defense requirements.

As this report is being published, the Department is considering how best to facilitate both DoD and defense industry transformation. Fundamentally, the key is changing the "program-based" paradigm within which both operate. Our military is moving toward a new doctrine – "effects-based operations" – designed to produce distinctive and desired results. The objective of effects-based operations is to tell commanders at all levels what objectives to achieve, not how to achieve them. Complementary DoD business practices could facilitate better acquisition decisions and make the DoD enterprise more transparent to suppliers and potential suppliers.

Executive Summary

Section 2504 of title 10, United States Code, requires that the Secretary of Defense submit an annual report to the Committee on Armed Services of the Senate and the Committee on Armed Services of the House of Representatives, by March 1st of each year. The report is to include:

"(1) A description of the departmental guidance prepared pursuant to section 2506 of this title.

(2) A description of the methods and analyses being undertaken by the Department of Defense alone or in cooperation with other Federal agencies, to identify and address concerns regarding technological and industrial capabilities of the national technology and industrial base.

(3) A description of the assessments prepared pursuant to section 2505 of this title and other analyses used in developing the budget submission of the Department of Defense for the next fiscal year.

(4) Identification of each program designed to sustain specific essential technological and industrial capabilities and processes of the national technology and industrial base."

This report contains the required information.

1. Introduction

1.1 The Challenge of Transformational Warfare

Operation Enduring Freedom demonstrated the value of transformational warfare. In this war, state-of-the-art and legacy products of the defense industrial base were matched with multi-dimensional, unconventional, and asymmetric tactics to produce a truly come-as-you-are war with a brand-new, transformational script. In 26 days from September 11, 2001 to the beginning of Operation Enduring Freedom on October 7, 2001, U.S. forces adapted new systems just coming out of development, converted legacy systems to new roles, and perhaps most importantly, networked systems to create new capabilities – all of which were focused to optimize battlefield impact

> *"These past two months have shown that an innovative doctrine and high-tech weaponry can shape and then dominate an unconventional conflict. This combination – real-time intelligence, local allied forces, special forces, and precision airpower – has really never been used before."*
>
> *- President George W. Bush*
> *December 11, 2001*

The Global Hawk and Predator[1] unmanned aerial vehicles, the two most famous new systems, removed pilots from harm's way while providing new capabilities. In both cases, the Department acted creatively to quickly transition new, urgently-needed technologies to the warfighter. Global Hawk rapidly delivered needed capability by essentially being sent to the operator for a wartime field test, with no dress rehearsal. The system decreased human footprint in theater by deploying from distant locations, and by remaining aloft for 24 hours without a pilot. Global Hawk provided persistent surveillance without risk to our warfighters, a critical new capability.

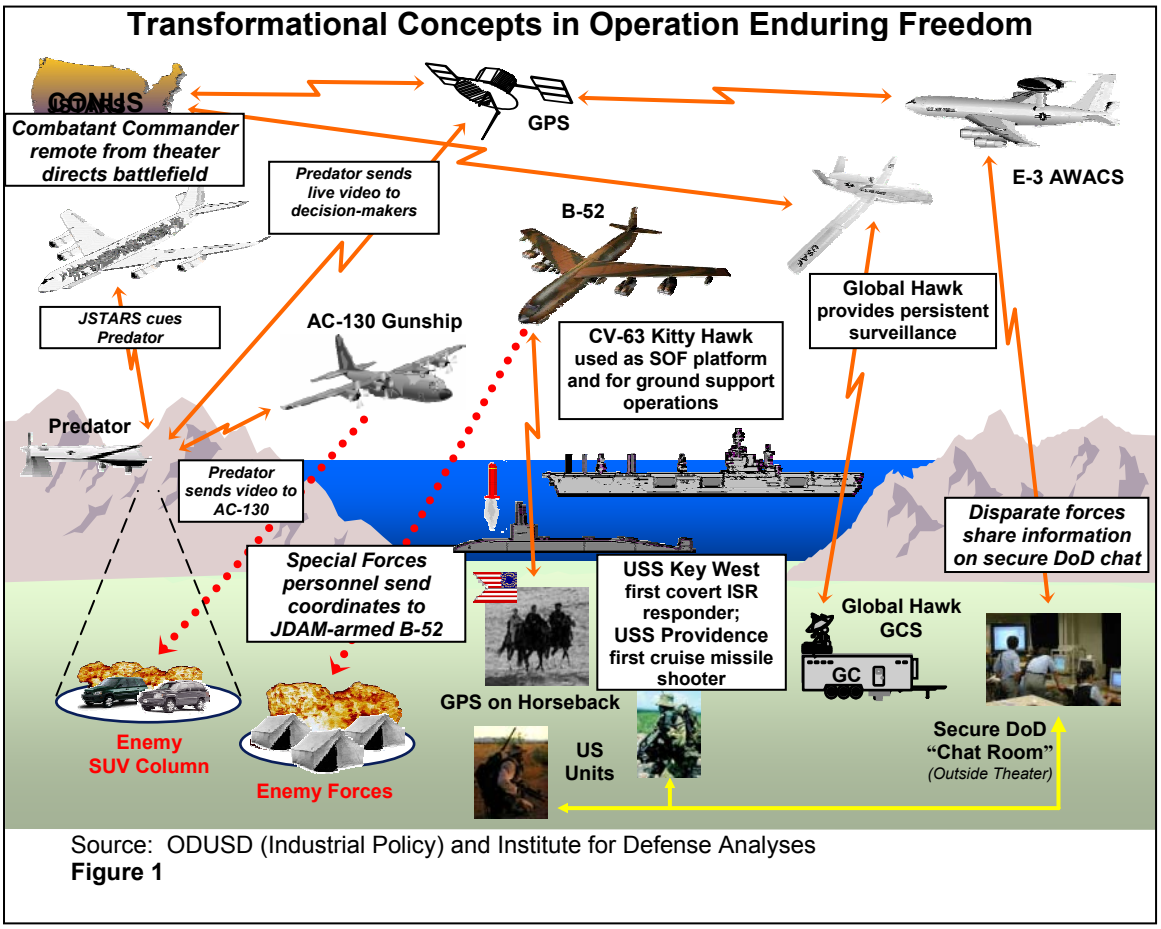
Although not an entirely new system, Predator brought new capability to the field. Predator flew lower than manned aircraft could safely fly to collect valuable imagery and transmit that imagery throughout the network. Predator also employed weapons for the first time, and did so with a configuration that had seen limited testing, demonstrating the value of rapid technology insertion. While the loss of 11 Predators between September 1, 2001 and December 31, 2002 (4 shot down) has demonstrated the risks of this approach, the value of allied lives preserved and prisoners-of-war not captured is incalculable.

Predator was an important element of a network built "on the fly." It found moving targets, tracked them, and killed them, while minimizing the exposure of our warfighters. Predator got cueing from the legacy Joint Surveillance Target

[1] Both Global Hawk and Predator were Advanced Concept Technology Demonstrations (ACTDs). ACTDs support DoD's transformational goals by exploiting mature and maturing technologies to solve important military problems. ACTDs allow warfighters to gain an understanding of proposed new capabilities and develop and refine a concept of operations to fully exploit the capability under evaluation. Operational requirements evolve as the warfighter gains experience with and understanding of the capability. Militarily useful quantities of the prototype are operated in realistic military demonstrations to make a determination on the military utility of the proposed capability.

Attack Radar System (JSTARS), and in turn, relayed low-altitude video to another legacy system, the AC-130 gunship for hand-off target engagement.

During Operation Enduring Freedom, the Services successfully employed network-centric concepts in communication, enabling linkages across various Service platforms. Operators transmitted Predator video to personnel in the field, and to the national command structure in the United States. Satellite communications and video links allowed commanders to be distant from the theater, while soldiers from disparate forces throughout the theater communicated via a secure DoD "chat room," coordinating activities, supporting bomb damage assessment, and reducing the chatter on limited tactical voice frequencies.



Source: ODUSD (Industrial Policy) and Institute for Defense Analyses
Figure 1

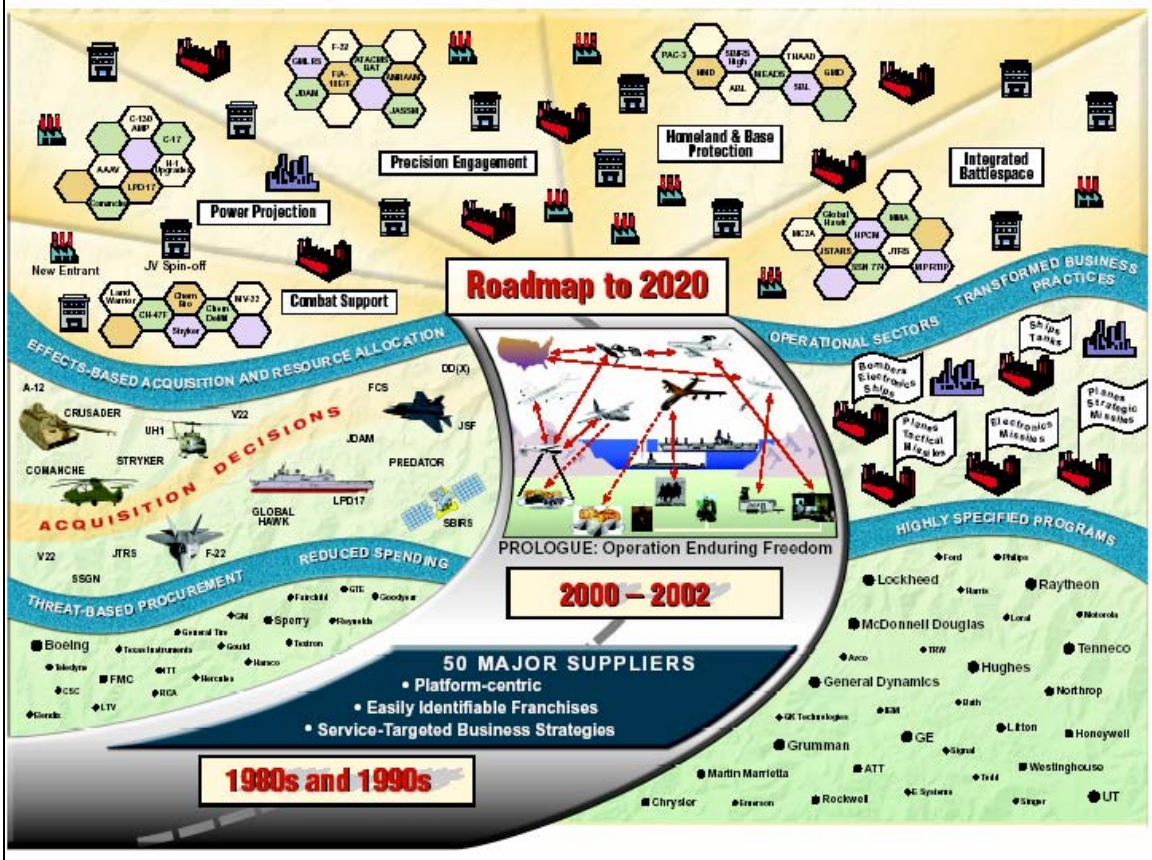
Several older weapons saw new life in transformed roles. The Kitty Hawk aircraft carrier, commissioned in 1961 as a weapon for the Cold War, saw service carrying Special Operations Forces to the new war and provided direct air support to forces on the ground. The B-52, first deployed in 1955 as a strategic bomber, saw action in close air support – thanks to the Global Positioning System operated by special forces soldiers on horseback and the Joint Direct Attack Munition.

Operation Enduring Freedom had the characteristics we expect of future conflict. It came at a time we didn't anticipate, in a place we had not prepared to fight, and was conducted in a manner invented on the fly. Some of the most important successes of Operation Enduring Freedom involved the defense industrial base: Global Hawk brought into operation before formally entering production; Predator armed nine months after approval; the cave-busting GBU-28 bomb developed in six months; and the Phraselator providing synthetic translation services in four languages, four months after the program was approved.

Operation Enduring Freedom required transformed warfighting concepts and capabilities. It reinforced the fact that speed is life on the battlefield and in deploying systems to the battlefield.

It is the challenge of today's policymakers to help shape an industrial base that will supply 21st century warriors as effectively as it has prior generations of American men and women in uniform. As Figure 2 shows, the defense industrial base of today is a distillate of its prior form.

A Roadmap to the Future



Source: ODUSD (Industrial Policy) and Institute for Defense Analyses
Figure 2

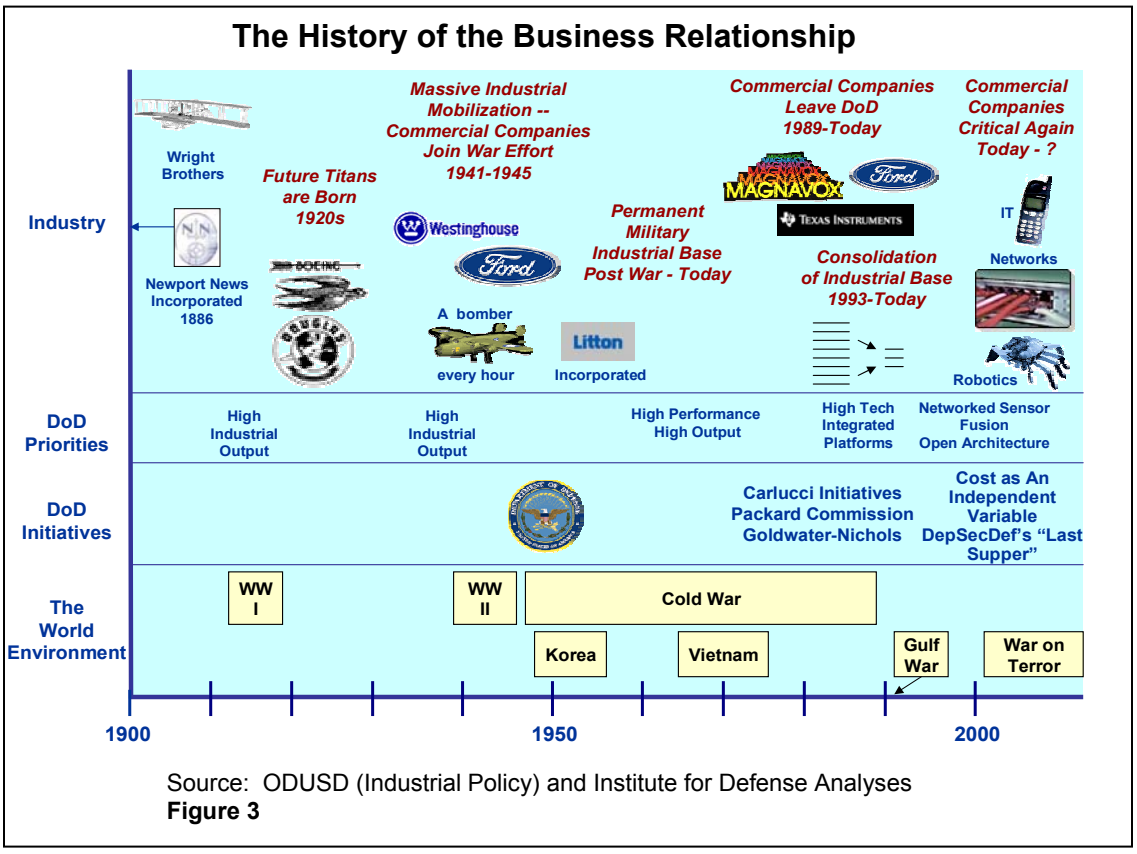
What were roughly 50 major defense suppliers in the 1980s have become five highly-consolidated, cross-Service, cross-platform prime contractors. As such, they are uniquely suited to provide us with system-of-systems approaches to requirements. Some are concerned about the allegedly excessive narrowing of the defense industrial base. We believe that consolidation was a normal market response to reduced demand, driven by the post-Cold War defense budget drawdown of the 1990s. However, we think that this "narrowing" may reverse itself as new companies join the base to respond to futuristic warfare needs. We envision that the defense suppliers of tomorrow may organize around operational, effects-based industrial sectors consistent with those depicted in Figure 2; and positioned to respond to Secretary Rumsfeld's operational goals for transformational warfighting.

Six Operational Goals for Transformation
- *Protect homeland and bases*
- *Project power*
- *Deny sanctuary*
- *Protect information networks*
- *C4ISR interoperability*
- *Unhindered access to space*

1.2 The Structure of the Defense Industry

Historical Perspective

The competitive pressures of the market place have shaped a smaller, more concentrated defense industrial base. As shown in Figure 3, consolidation spanning less than ten years fused and fundamentally changed an industry nearly a century in the making.



Source: ODUSD (Industrial Policy) and Institute for Defense Analyses
Figure 3

Among the 10 largest companies in the mid-1980s were strong franchise firms: McDonnell Douglas, General Dynamics, Rockwell, Lockheed, Northrop, Grumman, and the Boeing Company. These and other venerable "nameplates" were readily associated with famous platforms: Lockheed with Skunk Works and its many space, strategic and aircraft systems; Grumman, progenitor of naval aviation, with the F-14, E-2, A-6, and EA-6B; McDonnell Douglas with the new F/A-18, C-17 and missile programs; and Northrop cutting its teeth on the futuristic B-2, appearing to encroach on Lockheed's position in stealth. Among them all, General Dynamics had perhaps the most expansive footprint, with platform presence in all major combat arenas, from submarines to space systems.

Top Ten Defense Suppliers of 1985
McDonnell Douglas
General Dynamics
Rockwell
General Electric
Boeing
Lockheed
United Technologies
Hughes
Raytheon
Grumman

Together the top ten firms garnered over 34 percent of all DoD prime contract awards – $75 billion (Fiscal Year 2002 dollars). A further 28 percent of direct DoD revenues were widely distributed among an additional 40 firms. This sub-tier base maintained hierarchical subcontractor relationships with prime contractors generally characterized by well-established "teaming" relationships.

However, revolutionary innovations in military technology traditionally came from second tier or niche firms, organizations that frequently went on to dominate that market. These monumental leaps were developed only infrequently by the largest firms of the time.

By the early 1990s (Figure 4), many commercial firms in subtier defense niches left or dramatically reduced their presence in defense-specific product markets. Others, such as Westinghouse and Texas Instruments, divested defense activities to focus on non-defense core businesses. Companies such as General Electric divested defense-specific businesses because the defense market environment of decreasing budgets and slim profit margins did not support growth-oriented market dominance objectives to be the number one or number two player in a given market.

This exit of largely commercial firms from the defense industry precipitated a wave of mergers and acquisitions. Contraction of the industry, most visible at the top tier, proceeded in lockstep with the 51 percent decline in DoD research and development (R&D) and procurement funding from 1985 to 1998.

By the end of 2001, the five largest defense firms received the same percentage of DoD prime contracts as the top ten suppliers received in 1985. Therefore, Lockheed Martin, Boeing, Raytheon, General Dynamics and Northrop Grumman, the largest five in 2001, are as dominant in the defense market, on a relative basis, as the largest ten in 1985.

Sampling of "Nameplates" that Reduced/Eliminated Defense Presence

Parent Company	Military Business Divestiture	Military Products	Acquirer	Year Acquired
GE	Aerospace Division	Satellites, radar and sonar systems, simulation systems, communications systems, government technical services, and other aerospace and defense systems	Martin Marietta	1992
IBM	IBM Federal Systems	Systems integration and complex aerospace solutions (Skylab, AWACS, submarine sonar, FAA air control)	LORAL	1994
Ford	Ford Aerospace	Tactical missiles and satellites	LORAL	1990
LORAL	Defense operations	Communications and radiation-hardened spacecraft components, Sidewinder missile, airborne radar warning	LOCKHEED MARTIN	1996
Westinghouse	Defense and electronic systems division	Advanced radar systems, airspace management, and marine and space systems	NORTHROP GRUMMAN	1996
Lucent Technologies	Lucent Advanced Technology Systems	Undersea surveillance systems, signal processing defense systems, vibration control systems and related technologies	GENERAL DYNAMICS	1997
MAGNAVOX	Magnavox Electronic Systems	Satellite communications products, signals intelligence electronic combat situational awareness and combat identification systems	HUGHES	1995
CHRYSLER	Chrysler Tech. Airborne	Aircraft modification and defense electronics	Raytheon	1996
Texas Instruments	Defense Systems and Electronics Division	Guided missiles, electro-optical systems, and defense electronics equipment	Raytheon	1997
GM	HUGHES Defense	Airborne and ground-based radars, ground, air and ship-launched missiles, tactical communications, and training simulators and services, Air Traffic Control systems	Raytheon	1997

Source: ODUSD (Industrial Policy) and First Equity
Figure 4

The Defense Industry of the Future

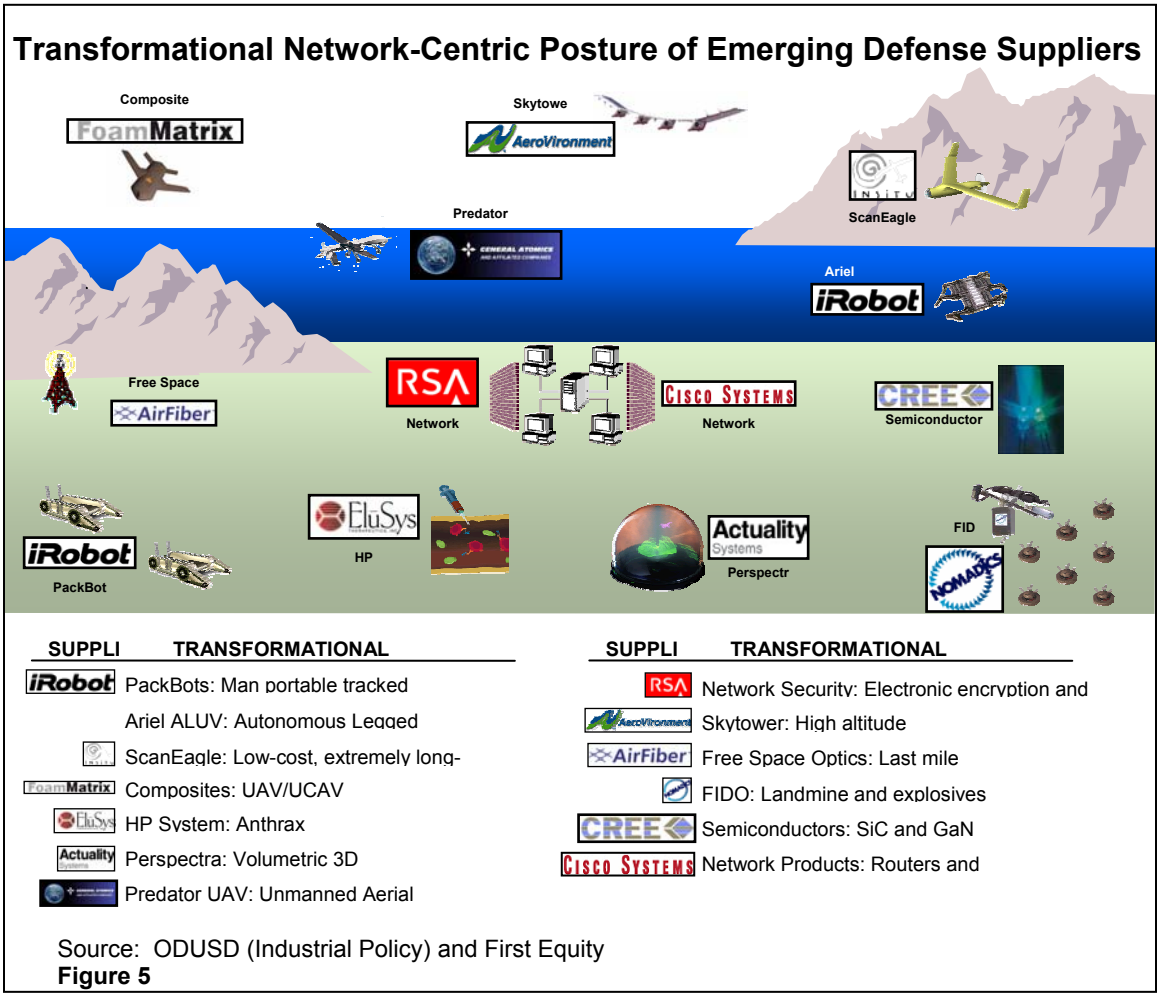
We believe that the current industrial landscape is a watershed and that transformation will spawn dozens of new entrants to the global defense industrial base.

We envision three major sources of new and innovative companies. First, we believe that most of the current prime contractors have understood the transformation mandate and will change with the times. Their corporate names may be the same, but their operating divisions likely have different names. They will be joined by lower tier firms that grow to be prime contractors.

The second source of new companies in the corporate landscape will be those companies – perhaps like iRobot (Figure 5), or those innovative small companies now in joint ventures with primes – that achieve critical mass on their own. Perhaps the surfboard manufacturer Foam Matrix, who entered the defense market to make wings for Lockheed's Joint Air-to-Surface Standoff Missile and now produces the wings for the Air Force's unmanned combat aerial vehicle in a joint venture with Boeing, will find enough markets outside of Boeing that it becomes a prime composite structures manufacturer on its own.

And third, there will be commercial companies or divisions of companies that form around defense requirements. These could be the pharmaceutical companies that present themselves to the challenges of chemical biological warfare and associated vaccination programs. Or they could be entertainment

companies like Westinghouse in the mid-1930s, whose radio broadcasting skills the government thought may be applicable to the development of radar. Today's entertainment companies might, for example, apply their ability in visualization to the battlefield of tomorrow.



Source: ODUSD (Industrial Policy) and First Equity
Figure 5

Figure 5 is illustrative of the products from emerging, innovative companies. While not meant to be definitive, this illustration shows how some of the technologies of emerging innovative companies could be incorporated and used by the military.

We expect that all companies within the defense industrial base, regardless of size, type, location or socio-economic category, must be able to function as nimbly as the warfighters of Operation Enduring Freedom, and extend the transformational trends that emerged in 2002. Much as the warfighters in Afghanistan sometimes exchanged sensor-shooter roles to achieve optimum operational effect, we expect prime and sub-tier companies to reverse roles when doing so increases their chances to win contracts. This also will provide an ancillary benefit – spreading innovation throughout the defense industrial base. We also expect that some of today's emerging defense suppliers will grow into tomorrow's industry giants.

Conclusion

Department research, development, and acquisition, and associated policies and program decisions play a major role in guiding industry transformation. DoD's budgets, policies and decisions focus market demand across a broad spectrum of industry segments to meet DoD requirements. First, the Department's weapons system acquisition policies and decisions direct the programmatic focus of industry. Second, decisions made on mergers and acquisitions involving defense firms continue to help shape the financial and competitive structure of the industry. Third, DoD's evaluations and assessments of sectors or specific defense industry issues help point to future budgetary and programmatic requirements. Finally, DoD incorporates industrial base policies into its acquisition regulations on an on-going basis.

This report focuses on industrial capabilities-related policies, decisions on mergers and acquisitions, and assessments that, when combined with DoD budgets and program decisions, shaped the defense market in 2002.

2. New DoD Policy

During 2002, the Department took significant steps to bring acquisition policy more in line with the vision of the Secretary of Defense to focus on transformational warfare requirements. During October, 2002, the Deputy Secretary of Defense canceled existing DoD acquisition policy documents (the DoD 5000 series), authorized interim guidance, and directed a new acquisition policy be developed within 120 days. The Deputy Secretary of Defense took this aggressive measure because of the Department's critical need to more rapidly deliver affordable, sustainable capability to the warfighter. The new policy will create an acquisition policy environment that fosters efficiency, flexibility, creativity and innovation—attributes judged critical for meeting transformational warfare requirements.

The new DoD acquisition policy emphasizes evolutionary acquisition as the preferred strategy and spiral development as the preferred vehicle to execute that strategy. This approach will facilitate rapid delivery of a military capability to the warfighter in initial and follow-on increments or spirals. With this approach, the warfighter will receive an initial capability as a starting point for fielding improved, layered, defense capabilities later as technology risks are resolved. Acquisition changes engendered by evolutionary acquisition and spiral development likely will effect changes in how weapons are developed and tested, how contracts are constructed, and how logistics support is provided.

The new DoD acquisition policy aims to give the program manager more authority and freedom to manage. The revised DoD 5000 series documents will implement all statutory requirements governing defense acquisition but will minimize DoD's self-imposed acquisition regulations. By minimizing regulatory requirements and removing prescriptive practices, the Department hopes to encourage program managers to offer innovative approaches to program planning and execution with the goal of delivering affordable solutions to the warfighter more rapidly.

The revised DoD 5000 series encourages flexible approaches to program oversight by the Milestone Decision Authorities. Revised DoD Directive 5000.1, "The Defense Acquisition System," will promote tailoring of regulatory program information requirements, acquisition phases and strategies, and the timing and scope of decision reviews based on a program's dollar value, risk, and complexity. This directive also will address the interrelationship between defense acquisition and recent guidance from the Joint Chiefs of Staff on requirements generation.

The Department believes that this new approach to acquisition also may attract and retain talented professionals in the acquisition workforce. It also should attract new companies to the defense industry, especially critical at a time when the military's integrated battlefield approach to warfighting requires high-speed communications and other commercial-like systems to outwit enemies.

3. Defense Mergers and Acquisitions

3.1 Introduction

Robust, credible competition is vital to providing the Department with high quality, affordable, and innovative products. DoD assessments of proposed business combinations (generally, domestic and foreign firm mergers, acquisitions, and joint ventures) complement its funding, policies, and decisions, and sustain credible competition in an evolving industrial environment.

The Department and the industrial structure on which it depends face a watershed between the platform-centered warfighting capabilities of today and the futuristic, network-centered warfighting capabilities the Nation will employ in the not-too-distant future. Operation Enduring Freedom underscored the need for multi-dimensional, unconventional, and transformational warfighting capabilities to sustain the nation's security. The concept of warfare is being transformed, warfighting capabilities are being transformed, and the industry that will support defense will transform, as well.

The implications of transformation are clear. The ideas and products of less traditional, and potentially smaller, companies increasingly will be important for transformational warfare; and the future defense industrial landscape will be significantly different than today's because of their importance and contributions.

The Department's challenge is to match the innovative capabilities of its suppliers with a defense industrial strategy that provides beachheads and bridges – not barriers – to their effective participation. It must establish, maintain, and strengthen industrial relationships that ensure that the future defense industrial base is both healthy and vital. In doing so, the Department also must balance the need to encourage competitive forces for innovation with the need to permit companies to scale up or combine with other firms to create new industrial capabilities essential for future warfare. Such flexibility is essential if the Department is to capitalize on the revolutionary technologies of tomorrow.

Compounding the challenge, national borders increasingly are irrelevant to how businesses are organized and staffed. Among the consequences of industrial consolidation and globalization are multinational companies with interlocking corporate directorates and production presence in multiple countries. Byproducts of industrial consolidation and globalization also include the possible loss of domestic industrial capabilities on both sides of the Atlantic, and an increasing degree of mutual defense interdependence between the United States and its allies. On occasion, the Department now participates in reviews of proposed mergers between non-U.S. firms when the defense material provided by those firms has significant U.S. DoD applications.

DoD reviews several kinds of business combinations involving defense suppliers: (1) proposed mergers or acquisitions filed under the Hart-Scott-Rodino Antitrust Improvement Act of 1976 (currently, transactions valued at more

than $50 million); (2) other collaborations among competitors that have been made public (joint ventures, mergers and acquisitions) of special interest to the Department that do not meet the Hart-Scott-Rodino Act filing threshold; and (3) analyses associated with proposed acquisitions of U.S. defense contractors by non-U.S. firms for which filings have been made pursuant to the Exon-Florio Amendment to the Omnibus Trade and Competitiveness Act of 1988.

The Department believes that there is effective competition and sufficient capacity to meet projected requirements for weapons platforms (for example, ships and aircraft) and major subsystems (for example, radar, electronic warfare, and expendable launch vehicles). Indeed, some industry sectors (for example, fixed-wing aircraft and solid rocket motors) still have substantial excess capacity. However, most defense industry capacity has been sized to peacetime procurement requirements. This may present a problem for consumables (for example, precision guided munitions) for which inventories are tight and demand rises dramatically during military operations. In such cases, the Department is taking action as necessary to increase production capacity.

Additionally, there are, and always have been, militarily important product areas for which the Department has somewhat unique performance requirements. Some "niche" product areas – such as microwave power tubes and high end radiation hardened microelectronics – have defense unique applications with low demand, are procured in small lots, and can be technologically sophisticated or difficult to produce. The Department monitors supply and demand issues for such products carefully to ensure its needs will continue to be met.

3.2 Merger and Acquisition Reviews

The Federal Trade Commission and the Department of Justice (the "Antitrust Agencies") have the statutory responsibility for determining the likely effects of a defense industry merger on the performance and dynamics of a particular market; and whether a proposed merger should be challenged on the grounds that it may violate antitrust laws. As the primary customer impacted by defense business combinations, DoD's views are particularly significant because of its special insight into a proposed merger's impact on innovation, competition, national security, and the defense industrial base. Accordingly, the Department actively works with the Antitrust Agencies.

DoD reviews are structured to identify impacts on national security and on defense industrial capabilities; evaluate the potential for loss of competition for current and future DoD programs, contracts and subcontracts, and for future technologies of interest to the Department; and address any other factors resulting from the proposed combination that may adversely affect the satisfactory completion of current or future DoD programs or operations.

In 2002, the Department reviewed 22 transactions pursuant to the Hart-Scot-Rodino provisions of the Antitrust Improvement Act (Figure 6). Of those cleared by the Antitrust Agencies, one (Northrop Grumman – TRW) required a

consent order to protect continued competition. Under an agreement with the U. S. Department of Justice, Northrop Grumman agreed, among other stipulations, to guarantee satellite payload availability to all competitors as required to meet DoD and other U.S. Government needs.

Defense Merger and Acquisition Reviews
Calendar Year 2002

Acquirer	Acquiree	Value ($ billions)	Remarks
L-3 Communications Corp.	Raytheon's Aircraft Integration Systems	$1.150	Cleared
L-3 Communications Corp.	PerkinElmer, Inc.'s Detection Systems	$.110	Cleared
L-3 Communications Corp.	SY Technology, Inc.	$.050	Cleared
GE Engine Services	Unison Industries. Inc.	N/A	Cleared
Northrop Grumman	TRW, Inc.	$5.900	Consent Order
Alliant Techsystems, Inc.	Boeing's Ordnance business	$.052	Cleared
Goodrich	TRW's Aeronautical Systems businesses	$1.500	Cleared
EDO Corp.	Condor Systems, Inc.	$.102	Cleared
Kaman Corp.	DSE, Inc.'s Dayron Division	N/A	Cleared
United Defense Industries	US Marine Repair	$.305	Cleared
DRS Technology	Eaton Corp (Navy Controls)	$.092	Cleared
Alcoa, Inc.	Fairchild Corp's Aerospace Fastener Unit	$.657	Cleared
GenCorp's Aerojet	General Dynamics' Space Propulsion	$.090	Cleared
L-3 Communications	Westwood Corp.	$.027	Cleared
Veridian Corp.	SIGNAL Corp.	$.227	Cleared
Honeywell Automation & Control Solutions	Invensys plc (Invensys Sensor Systems)	$.415	Cleared
L-3 Communications Corp.	Technology Management & Analysis Corp	$.050	Cleared
L-3 Communications Corp.	Wescam Ltd.	$.119	Cleared
Timken Company	Torrington unit of Ingersoll-Rand Company	$.840	Cleared
DRS Technologies Inc.	Paravant Inc.	$.105	Cleared
BAE Systems PLC (North America)	Condor Pacific Industries, Inc.	$.059	Cleared
Eaton Corporation	Mechanical Products, Inc.	N/A	Cleared

Notes: Transactions are listed in chronological sequence by filing date.
N/A indicates transaction value is not available.

Figure 6

3.3 Foreign Investment in the United States

The Exon-Florio Amendment to the Omnibus Trade and Competitiveness Act of 1988 established Section 721 in the Defense Production Act. This section authorizes the President to suspend or block foreign acquisitions, mergers, or takeovers of U.S.-located firms when they pose credible threats to national security that cannot be resolved through other provisions of law.[2] The President has delegated management of the Exon-Florio Amendment to the interagency Committee on Foreign Investment in the United States (CFIUS), chaired by the Department of the Treasury.

Under Exon-Florio, the President has 30 days from the time he is notified of a foreign acquisition to initiate an investigation of the transaction. During the first 30 days after formal notification CFIUS members conduct a preliminary review to determine whether the transaction poses credible threats to national security and, if so, whether there are means to adequately mitigate those threats under various statutes or departmental regulations. By the 30th day, the CFIUS must either approve the transaction, with or without risk mitigation measures, or initiate a Presidential Investigation. There are no other options under the law. If the CFIUS begins a Presidential Investigation, it must complete a report on the Investigation within 45 days. The President then has 15 additional days to decide what action to take. Amendments to Exon-Florio enacted in 1992 require the President to inform Congress of his decision in each case involving a Presidential Investigation.

The Department is a member of the interagency Committee. As a CFIUS member, DoD evaluates the national security aspects of proposed foreign acquisitions of U.S. defense contractors and of other firms impacting national defense indirectly. In assessing foreign acquisitions, DoD's principal objectives are to: (1) facilitate the development of an integrated defense industrial base among U.S. allies and trading partners to increase interoperability in coalition warfare and reduce DoD acquisition costs; and, simultaneously, (2) avoid the risks of unauthorized transfer of classified information and military and dual use technologies as well as protect the reliability of supply of goods and services to the Department.

To assist in achieving these latter objectives, the DoD determines in each case whether the firm being acquired possesses critical defense technology or is otherwise important to the defense industrial and technology base. The intelligence community also prepares for the Department a Risk Assessment of the acquiring firm and country which evaluates (1) their compliance with U.S. and international export control laws and other international regimes which regulate proliferation of weapons of mass destruction; (2) their potential reliability as suppliers to the defense industrial base; (3) their support in fighting international terrorism.

[2] Excepting the International Emergency Economic Powers Act.

Given the statutory constraints of the Exon-Florio Amendment to the Defense Production Act, which serves as the basis for CFIUS' review of proposed foreign acquisitions, DoD cannot publicly discuss specific reviews. Information submitted to CFIUS is protected from disclosure by law to ensure that voluntarily submitted sensitive business information is not compromised.

However, since 1988, the CFIUS has reviewed over 1,400 transactions. Only 19 of these transactions resulted in Presidential Investigations; and in only one case did the President formally prohibit an acquisition. The low number of Presidential Investigations and blocked transactions is due to the fact that most transactions that involve credible threats to national security are resolved by risk mitigation measures negotiated either by individual departments under their own regulations or by the CFIUS, itself.

During 2002, at the aggregate level, a review of the roughly 40 foreign acquisitions of U.S. firms indicates that thirty-four percent of the acquired companies possessed critical defense technologies or were deemed to be otherwise important to the defense industrial and technology base (Figure 7). Specifically, three percent of the transactions involved U.S. firms deemed to possess critical technologies; eight percent of the firms were determined to be otherwise important to the defense industrial base; and 23 percent met both criteria. In most of these cases, DoD acting under its own industrial security regulation, imposed measures on the acquiring firms to reduce the risks of foreign ownership, control and influence on national security. In 66 percent of the transactions reviewed, the Department found no indications that the U.S. firm possessed critical technologies or was otherwise important to the defense industrial base.

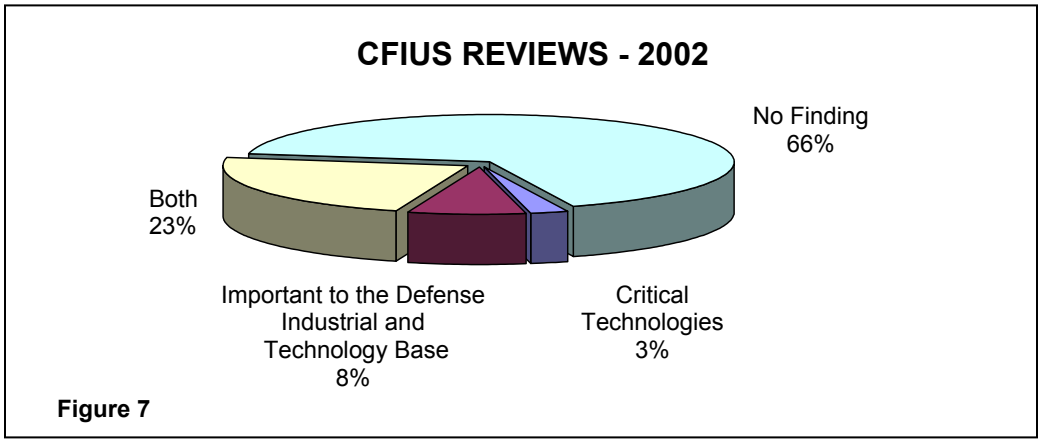


Figure 7

3.4 Sustaining Competition in the 21st Century

Sustaining competition to meet the transformational warfighting requirements of the 21st Century poses special challenges. As the defense industry evolves to meet the challenges of 21st Century transformational warfighting, the Department will seek to sustain effective competition by considering several additional factors more intensively when it assesses proposed business combinations:

- As the Department moves from platform-centered warfighting capabilities to sensor/network-centric capabilities, the need to develop and sustain industrial and technological capabilities for legacy systems will decline, as will the need to maintain platform competition after DoD awards last-of-type platform program contracts.

- New entities may gain horizontal and/or vertical capabilities that permit them to provide netcentric, transformational, or system of system solutions to defense needs that were not previously possible.

- Conversely, the primacy of information technology capabilities will heighten interest in potentially anticompetitive aspects of vertical integration resulting from proposed business combinations. Vertical integration could impact the Department's ability to mix and match industry-best information/sensor capabilities that might reside in competing firms.

- As a consequence of worldwide defense industry consolidation and collaboration, the Department must determine if effective competition from non-U.S. defense firms mitigates anticompetitive risks associated with U.S. defense firm combinations.

- The Department also must assess whether foreign firm acquisitions of U.S. defense firms likely will result in the transfer of critical technologies from the U.S. industrial landscape and/or move the strategic direction of the acquired firm away from U.S. national security priorities.

- Finally, it will be difficult to forecast all of the industrial and technological capabilities necessary for DoD's desired transformational warfighting capabilities. The industry sectors for which the Department has a significant interest in establishing oversight in order to maintain competition may expand dramatically to include heretofore "commercial" sectors.

4. Industrial and Technological Capabilities Assessments

4.1 DoD-Wide

Tactical Aircraft Industrial Base Assessment (February 2002)

The Office of the USD (AT&L) initiated this assessment in response to a requirement in the FY02 Defense Authorization Act to provide projections for aircraft procurement, including foreign military sales, through 2015 and to detail actions the Department has taken to encourage teaming arrangements in the JSF program. The report described the present state of play within the aircraft industrial base and discussed the impact of future military aircraft development and foreign military sales on the industrial base. Addressing the congressional concern regarding JSF, the report outlined an alternative acquisition strategy that the Department investigated in an attempt to preserve a tactical fighter airframe industrial base and to promote future competition. The study concluded that the three prime airframe manufacturers remain viable for the foreseeable future based on U.S. and overseas military aircraft requirements.

Helicopter Industrial Base Study (April 2002)

The Office of the USD (AT&L) initiated this study to provide decision aids for the Nunn-McCurdy actions related to the UH-1 and CH-47F and to obtain insight into competition and innovation in the helicopter industry. The study confirmed that firms within this industry regularly use joint ventures/partnering to capture and maintain market share. The study affirmed the monopolistic behavior of this industry resulting from a lack of competition for new platforms and noted that the manufacturers have little incentive for investment in innovation. Subsequent to this study, the Navy initiated a study to analyze alternatives for the H-1 helicopter.

Unmanned Aerial Vehicle (UAV) Industrial Base Study (August 2002)

The Office of the USD (AT&L) initiated this study to determine if the current unmanned aerial vehicle (UAV) industrial base is adequate to meet present warfighting requirements and to determine what changes may be required to meet future requirements. The study concluded that for current requirements, the existing industrial base is adequate. However, if the future includes buying large numbers of UAVs, then the Department should consider changes to its procurement pattern. These changes are necessary for several reasons: to ensure full competition at reasonable intervals so as to harvest technology enhancements and control requirements creep; to realize the cost efficiencies of volume procurement; and to provide requirements and incentives for reliability and interoperability. Such significant changes in procurement practices would necessitate the establishment of an overarching acquisition organization for all unmanned systems (sub-surface, surface, and air) in order to realize manufacturing and operational synergies.

Space Research and Development Industrial Base Study (September 2002)

The National Reconnaissance Office and the USD (AT&L) led an effort, in support of the National Security Council's Policy Coordinating Committee for Space, to assess the U.S. space technology industrial base and to provide options for the R&D portion of a new national space strategy. Phase I identified significant problem areas in R&D across all sectors – military, civil, commercial and academia. Phase II focused on a few of these areas: identifying critical technologies related to space, assessing the health of space industry sub-tier companies, identifying R&D best/worst practices; and identifying effective R&D investment strategies. The study identifies the desired end-state of providing a healthy space R&D industrial base to bolster the foundation of U.S. world space technology leadership. The Department will use the study findings to frame a new U.S. space policy to encourage and sustain R&D growth well into the 21st century. Also, the Department will use the methodology pioneered here to conduct the follow-on studies recommended in "Transforming the Defense Industrial base: A Roadmap," summarized later in this section.

Assessment of Precision Guided Munitions Capabilities to Meet Contingency Requirements (September 2002)

During Operation Enduring Freedom, expenditure rates during the period of highest use exceeded production rates for certain precision-guided munitions such as Joint Direct Attack Munition (JDAM) and Laser Guided Bomb (LGB). Accordingly, the Department conducted an assessment of production capability for an array of cruise missiles and precision-guided munitions to meet potential contingencies in Southwest Asia. The assessment considered the recent supplemental funding used to increase munitions production rates, long-term production capacity, and worldwide stockpiles. The study concluded the Department has access to sufficient production capacity for potential contingencies and retains an adequate, but reduced, reserve for future military engagements.

Overview of Industrial Base of Tactical and Precision Munitions (September 2002)

The OUSD (AT&L) conducted this study to assess in broad terms the industrial capabilities of the missile and precision-guided munitions sector. The study focused on the missile industry response to the changing DoD market, issues concerning the supplier base, and long-term considerations relating to unplanned contingencies. The study involved collecting data from prime contractor and significant sub-tier contractors for production rates, costs, overhead structure, technical capability and supplier base. The study concluded that significant restructuring has taken place in the DoD missile industrial base. However, given increased production requirements, bottlenecks now exist at the sub-tier supplier level. These bottlenecks are exacerbated by procurement production approaches which constrain the supply of preferred munitions. The study recommended the Department identify and adapt to other industries those practices that allowed the missile industry to reduce excess production capacity

to match demand; to identify and create a watch list of sub-tier suppliers (including production constraints); and to resolve problematic procurement practices.

Competition and Innovation in the Fixed-Wing Industry (October 2002)

The Office of the USD (AT&L) asked RAND to initiate this study in response to a requirement in the FY02 Defense Appropriations Act to prepare a comprehensive analysis and report on the risks to innovation and the cost of limited competition in contracting for military aircraft. RAND examined the requirements necessary to maintain a high level of innovation, assessed the prospects for innovation and competition in the industry and identified policy options available to the Department to guide the evolution of the industry to ensure maintenance of critical capabilities.

The study found the U.S. military aircraft industry evolving to meet changing demands of DoD. Boeing and Northrop Grumman's restructuring to pursue UAV/UCAV opportunities is just one example of how industry is responding to the changing demand of the Department.

RAND's research found the role of prime and subcontractors has changed, with significant component innovation now occurring at the supplier level. Also, historically, the dominant firms in one era have rarely been the source of revolutionary innovation leading to change.

The report also noted that procurement funding will likely be adequate to sustain the basic institutional structure of the current prime military aircraft contractors through at least the end of the present decade. New R&D activities with a high likelihood of occurrence (a new tanker, new ISR, and UCAV) may be sufficient to sustain the design and development capabilities of the current primes through the middle of this decade. However, commercial derivative and UAV/UCAV programs as currently planned will be insufficient to sustain the current industry structure and capabilities beyond this decade. Given the Administration's commitment to devoting about three percent of our increasing defense budget to science and technology (S&T), it is likely that new R&D opportunities will emerge beyond the period of this FYDP to buoy this outlook. If the DoD decides to begin a new major combat aircraft program before the end of this decade, that would provide a stronger basis for sustaining current structure and capability. Conversely, if the number and frequency of major aircraft programs continues to diminish, it will be increasingly difficult to sustain an industry of the present size and posture.

Transforming the Defense Industrial Base: A Roadmap (February 2003)

The Deputy Under Secretary of Defense for Industrial Policy conducted this study during calendar year 2002, but published it in February 2003. It is summarized here because of the interest it has generated both inside and outside of DoD. The study report is intended to provide an industrial base roadmap to Secretary of Defense Rumsfeld's vision of transformation. If

followed, the roadmap could position the Department to transform itself and its supplier base, and deliver innovative, network-centric weapons systems to the warfighter more expeditiously. It is available on the Internet (http://www.acq.osd.mil/ip).

The report notes that the concerns of emerging defense suppliers resonate strongly with concerns expressed previously by legacy defense suppliers:

- Insufficient visibility into the military enterprise.
- Inadequate funding and advocacy for new technology transition.
- Difficulty building a strong, interactive relationship with customers.
- Cumbersome system design specifications.
- Lengthy, laborious sales cycles.
- Limited access to development and investment capital.

The report recommends that the Department consider:

- Viewing the industrial base as being composed of operational effects-based sectors that support transformational warfighting.
- Organizing its decision processes to optimize operational effects – not programs, platforms, or weapon systems.
- Evaluating technological and industrial capabilities and concerns within these sectors, including the investment and competitive issues necessary for informed, effective decision-making.

The recommendations offered for consideration in the report are intended to provide emerging and legacy suppliers of interest to the Department more transparency into the programs and processes that constitute the military enterprise. The report concludes that recasting the defense industrial landscape across operational effects-based sectors and organizing the Department's decision-making processes to optimize operational effects would improve supplier visibility into the military enterprise and help to more systematically secure "invention-to-weapon" technology transition funding. If programs were arrayed this way with corresponding management structures, emerging defense suppliers would be able to ascertain opportunities that cut across individual programs and platforms; and identify DoD and prime contractor points of contact with whom to engage. Conversely, senior DoD leaders would be better positioned to identify technology "gaps" affecting both individual and multiple programs. With such visibility, DoD leaders also would be positioned to advocate sufficient transition funding to "pull" the promising new technologies that would enhance operational effects for multiple defense systems.

The Department is discussing report recommendations. For the first follow-on study implementing the third recommendation, the Deputy Under Secretary of Defense for Industrial Policy will assess the ability of the defense industrial base to field the integrated battlespace technologies critical to

Secretary Rumsfeld's transformation mandate. It will be published in late fall 2003.

4.2 Army

Update of Army Tactical Wheeled Vehicle Assessment (January 2002)

The Army conducted a follow-on study of the tactical wheeled vehicle sector by assessing seven key critical sub-sectors. All sub-sectors, except tires, received acceptable ratings with stable trends. The tire sector had improved since the last assessment and should continue its upward trend. Most of the key sub-sectors have at least two manufacturers, and all of them possess capabilities compatible with commercial industry. Capabilities required to design, produce and maintain the current fleet of tactical wheeled vehicles are common to both the commercial truck and heavy industry sectors. This allows the Army to take advantage of dual use opportunities. The study concluded that the overall sector is stable but declining due to the decrease in DoD funding. Most of the tactical wheeled vehicle manufacturers are financially stable and not solely dependent on military vehicle production.

Update of Watercraft Sector Assessment (June 2002)

The Army conducted this follow-on study to assess the stability of the watercraft sector. The Army surveyed manufacturers of all types of small boats used to support and operate ports and to conduct logistics over the shore operations in areas without port facilities. The assessment concluded that the watercraft sector is stable. All prime contractors are financially sound and should remain so because they also function as commercial enterprises that place military adaptations on commercial watercraft.

Army Missiles X-Band Radar Sector Study (July 2002)

The Army initiated this study to determine whether the domestic and foreign vendor base was adequate to fabricate certain components for the drive platform and control system (DPCS) of the X-band Radar (XBR). Currently, VertexRSI is the sole source manufacturer of DPCS. The study focused on determining whether an alternate method of obtaining DPCS would better meet the Army's requirements. The Army reviewed the ability of several sub-contractors to produce unique DPCS components and examined whether the domestic industrial base could then integrate the components. The analysis concluded the domestic industrial base is capable of producing the separate DPCS components and then integrating the production of DPCS for the XBR program. The Army used the analysis to make a more informed decision regarding a contract for another XBR DPCS. The Army continues to rely on VertexRSI but recognizes that other experienced vendors are capable and willing to bid on future contracts.

Army Ammunition Production Assessment (August 2002)

The Army Materiel Command (AMC) periodically makes an assessment of the Army's ammunition production capabilities in light of the Army's operational requirements. AMC conducted the 2002 assessment in light of Program Objective Memorandum requirements and replenishment demands. AMC also assessed the requirement for additional force protection at the ammunition plants. The assessment identified several deficiencies in meeting total requirements. The AMC uses the results of the periodic assessments to support decisions on industrial base investments as well as to support acquisition strategies. In fiscal year 2002, the Army invested $108 million to preserve, protect and improve government-owned industrial facilities. The Army spent approximately $10 million of this amount on additional ammunition plant security.

4.3 Navy

JCC(X) Industrial Base Assessment (March 2002)

The Joint Maritime Command and Control Capability (JCC(X)) ship is the Navy's proposed replacement capability for the current four aging command ships. The Naval Sea Systems Command initiated an assessment to determine if there is sufficient capacity and capability within the shipbuilding and supporting industry sectors to ensure timely and cost-effective execution of the JCC(X) program. The study assessed 8 shipyards and 39 supporting industry companies (10 combat system manufacturers and 29 hull, mechanical and electrical equipment manufacturers). The study found that four of the eight shipyards were capable of building JCC(X) with minimal risk to the program. All supporting industry sectors received a rating of low risk, with the exception of the propulsion shafting sector which received a moderate risk rating because 90 percent of the manufacturing capability lies in a single manufacturer. The study concluded that the shipbuilding and supporting industry sectors were capable of supporting the JCC(X) requirements.

CVN(X) Updated Industrial Base Assessment (June 2002)

The Naval Sea Systems Command initiated an assessment of the CVN(X), the next-generation nuclear-powered aircraft carrier, as required documentation for a programmatic milestone decision to determine whether the shipbuilding and supporting industry sectors were capable of meeting CVN(X) requirements. The study found that Newport News Shipbuilding (NNS) had the industrial and technological capabilities necessary for the CVN(X) program but had moderate risk regarding its ability to hire and retain sufficient skilled electricians, machinists and pipe fitters to meet the projected increase in workforce requirements. The study found that twenty-eight companies were capable of supporting CVN(X) requirements. The propulsion shafting sector received a moderate risk rating because 90 percent of the capability in this sector lies in one manufacturer. The auxiliary deck equipment sector received a moderate risk rating due to financial viability concerns for the current supplier;

however other suppliers are available to meet Navy requirements in this sector. The Navy and NNS are addressing the potential shortage of skilled workers.

MH-60R/S Industrial Capabilities Assessment (July 2002)

The Navy conducted an assessment of the MH-60R/S helicopter program in support of a programmatic milestone decision by the Defense Acquisition Board. The Navy assessed the economic viability and production capabilities of the prime contractor and the chief subcontractors as low with respect to financial risk and industrial capability risk. Of the 17 rotary-wing component contractors assessed, nine were determined to have low financial risk; four, moderate risk; and one, high risk (Simula, Inc.). The Navy concluded that Simula warranted close monitoring. The eight helicopter component systems potentially involved in the upgrade programs received an assessment of low risk. The assessment indicated the current industrial base is capable of supporting the MH-60R/S helicopter program and of completing the MH-60R/S upgrade program.

Update of Microwave Power Tube Industrial Assessment (December 2002)

The Department uses microwave power tubes such as traveling wave tubes, klystrons, and crossed field amplifiers to generate and amplify microwave energy in land, sea, air, and space applications. The Navy, as DoD's executive agent, monitors microwave power tube industrial and technological developments and DoD demand. During 2002, L-3 Communications acquired Northrop Grumman's Electron Devices, a worldwide supplier of microwave power devices, allowing them to expand their offerings and leadership position in this niche market.

The continuing tightening of safe exposure requirements for beryllium necessitates the development of an environmentally friendly replacement material for the beryllium based lossy ceramic used in microwave tubes. Although preliminary alternative materials continue to be promising, the Navy is monitoring these until they become fully developed and operationally sufficient. As is true for many products used predominantly by the Department, manufacturers have excess production capacity. These manufacturers continue to work to eliminate excess production facilities but are concerned about the availability of a correctly skilled workforce. Market share balances, both U.S. and foreign, are shifting and being monitored for impact. The Navy is focusing on the correct level and mix of resources, facilities, equipment and people to ensure the U.S. defense industry continues to have capabilities sufficient to meet DoD's long-term needs for microwave power tubes at an affordable cost.

4.4 Air Force

Consolidated Report on Air Force 767 Leasing Proposal (January 2002)

The Air Force conducted several aircraft production sensitivity analyses to evaluate the proposed leasing of 100 Boeing 767 aircraft configured as tankers. The aircraft would be used to replace the aging fleet of KC-135s. This report focused on the overall impact of the leasing arrangement to the aircraft production base. Calculations were made at the 767 product line and plant levels and then aggregated for the entire commercial aircraft division of Boeing. The analysis showed that the additional 100 military tanker requirement did not significantly impact the overall aircraft production base or Boeing's viability as a company. Assuming a six-year production period, the added 100 aircraft represented a less than five percent increase in workload. The production sensitivity analysis was one of many factors the Air Force used in assessing 767 lease viability.

Air Force Sensors Industrial Base Assessment (May 2002)

The Air Force designed this assessment, which focused on ground-based and airborne radars of interest, to identify key requirements for sensor components and subsystems, to identify technology trends, and to evaluate the sufficiency of the supporting industrial base. The study found that the sensors industry, dominated by three competitors, is stable and is maintaining necessary capabilities. Suppliers of integrated circuits and miocrowave power tubes appear to adequately support military applications. Problematic areas include the power tube industry where specialized engineers are in short supply and the large phased-array radars where obsolescence is the biggest cost driver for operations and sustainment. The study concluded that migration to open architectures and greater use of commercial-off-the-shelf (COTS) components would simplify sustainment and technology refreshment and provide low-cost solutions to military radar requirements. The Air Force Electronic Systems Command is using this study to develop an integrated investment strategy to both demonstrate design and production concepts as well as to address supplier issues.

Advanced Microwave Tube Technology Project (September 2002)

The relatively small quantity demand and the hazardous nature of silicon carbide loaded beryllia ceramics (BeO/SiC), a critical substance used in microwave tubes as a radio frequency loss material, caused the last U.S. manufacturer to cease production. The Air Force conducted this study to identify and characterize candidate replacement materials. The study evaluated over 40 different materials from a number of suppliers and identified two candidate products being developed at Ceradyne (now Semicon) and Sienna as demonstrating the requisite physical characteristics for use in the highest power, microwave vacuum tube applications. The study concluded, however, that before these new materials can gain wide acceptance by the microwave tube industry, tests must be done to verify that the electrical and physical

characteristics of these new materials remain constant when they are reproduced in large quantities. The Air Force will use this study as the technical detail to support inclusion of the alternate materials in DoD's Traveling Wave Tube Vendor Initiative, a program wherein the Department shares developmental costs with industry to support strengthening of the industrial base.

Manufacturing Technology (ManTech) Program Strategic Planning Initiative (October 2002)

The Air Force's ManTech program is designed to develop and implement the advanced manufacturing capabilities required to more effectively satisfy the needs of warfighters. The Air Force conducted this study to evaluate the ManTech program in light of present and future industrial base realities. The study found that because the DoD market continues to be highly unpredictable (for example, budget and program uncertainties), primes and major subsystem suppliers are making a minimal investment in advanced defense-unique manufacturing capabilities. The study concluded that the Air Force should focus its program on the technology developers and fabricators for the leading edge materials, devices, components and subassemblies that control upwards of 70 percent of an aerospace system's value stream. Improving operational functions in suppliers' factories will reduce the cost, shorten the flow time, and improve the quality of processes and products.

4.5 Defense Logistics Agency

Tray Pack Ration Readiness Follow-on (September 2002)

Increased requirements submitted in support of Operation Enduring Freedom caused the Defense Logistics Agency (DLA) to re-evaluate the defense industry's ability to support ration requirements. DLA compared current industrial capabilities for tray pack rations to those required to meet contingency requirements. The study concluded that, due to shortfalls in commercial components, peacetime production capabilities are insufficient for maintaining enough tray pack rations for wartime requirements. In order to meet contingency requirements, the study recommended DLA pre-stock tray pack metal cans and improve selected production processes for both metal and polymeric tray packs. The study indicated a need for DLA to transition from metal can trays to polymeric trays to meet Service requirements. During FY02, DLA awarded contracts totaling $210,000 to upgrade and maintain government-furnished equipment that increased efficiency, reduced production lead-times, and increased production output of tray pack rations.

Joint Services Lightweight Integrated Suit Technology (JSLIST) Follow-on (October 2002)

The Battle Dress Overgarment (BDO) chemical-protective ensemble is out of production and is being replaced by the JSLIST ensemble. DLA reassessed the current production capabilities for JSLIST to determine if they were adequate

to meet surge requirements. Five U.S. facilities produce the JSLIST suits. A German firm, Blucher GmbH, is the sole producer and patent holder of the JSLIST suit liner fabric. During 2002, Blucher established and made fully operational a U.S. subsidiary, Tex Shield, for manufacturing the fabric liner. The DLA assessment found that carbon spheres are the critical long-lead item needed to produce the fabric liner. Blucher GmbH has a six-month reserve of carbon spheres in its Germany plant. The study assessed this supply as sufficient to meet warfighting requirements. The study concluded that due to the current inventory levels and active production contracts, no further investments were required to meet surge requirements. New fabrics are currently being tested which, when certified, could make the JSLIST ensemble a completely domestic product with potentially shorter production lead times. The new certified fabrics will supplement existing fabric, thereby augmenting the production capability of the JSLIST.

Chemical Protective Gloves Follow-on (October 2002)

Chemical protective gloves are an integral part of the chemical protective ensemble used to protect troops from chemical and biological weapons attack. This assessment re-evaluated issues previously addressed in fiscal years 1996-2001. The study concluded that current production levels are sufficient to sustain essential industrial capabilities. If for any reason these production levels became inadequate, DLA would re-institute an industrial base maintenance contract until the new generation glove is certified, possibly in 2004.

Pharmaceutical, Medical/Surgical, Medical Equipment Follow-on (October 2002)

This assessment re-evaluated whether the commercial industrial base can support DoD's medical contingency requirements, examining stock availability for pharmaceutical items, medical/surgical supplies and medical equipment. This assessment is a follow on to an original study conducted in 1999 that identified shortfalls in meeting Service wartime requirements. DLA manages these shortfalls through a Medical Contingency File database that consolidates the time-phased wartime requirements from all Services. Progress in overcoming Service shortfalls is measured by the number of Medical Contingency File items covered under a contingency contract. The 2002 re-assessment determined that DLA can overcome approximately 50 percent of the shortfall, a significant increase over the 30 percent level of 2001.

DLA has identified funding requirements in its Program Objective Memorandum submission that would help it achieve 85 percent coverage by Fiscal Year 2006. To support the Services' war requirements, DLA invested approximately $25 million in FY02 contingency contracts to maintain availability of supplier safety stock. These actions provide the Department immediate access to an estimated $410 million of pharmaceutical supplies, $350 million of medical/surgical supplies, and $10 million of medical equipment.

Nerve Agent Antidote Autoinjectors Follow-on (November 2002)

Nerve Agent Antidote Autoinjectors (NAAAs) are military-unique items designed for rapid self-administration through clothing upon exposure to a nerve agent. DLA revalidated a finding of a previous study that the industrial base cannot satisfy the Services' requirements for NAAA without DoD intervention. Quantities required to meet mobilization requirements greatly exceed peacetime needs. DLA has contracted with Meridian Medical Technologies, the sole U.S. manufacturer of NAAAs, to retain a capability to satisfy surge and sustainment shortfalls during wartime. The contract guarantees the production of five million autoinjectors within 142 days of mobilization of the plant.

4.6 Defense Contract Management Agency

Assessment of Contoured Diaphragm Aircraft Coupling Suppliers (October 2002)

The Defense Contract Management Agency (DCMA) identified problems with delivery performance and problems with supply of critical items on the part of the DoD's primary supplier of contoured diaphragm aircraft couplings. The DCMA initiated an assessment to determine if there were serious industrial base risks in this sector that would prevent the Department from satisfying its requirements. The study validated that TRW Aerospace (now Goodrich Aerospace), in Rome, New York, is the single qualified source for aircraft flexible power transmission shafts and couplings used on virtually all U.S. military aircraft. Goodrich Aerospace has designed and developed the product technical data packages, to include the proprietary processes and patents necessary to fabricate the current products. In light of this assessment, DCMA initiated action to identify an alternate source. Preliminary estimates are that a $1 million development cost and one or two years of prototype development would be required to develop this source. No further action has been taken because the current contractor recently has taken steps to improve its performance. DCMA continues its research for potential alternate sources.

4.7 Missile Defense Agency

Targets Integrator Industrial Base Assessment (April 2002)

The Missile Defense Agency (MDA), with the assistance of the DCMA, conducted this assessment of the business base, target products, and target integration capabilities of the following companies: Coleman Aerospace (part of L-3 Communications), Orbital Sciences, Lockheed Martin, and TRW (now Northrop Grumman). The assessment characterized the targets integrator market sector as one of low volume, diverse products, and intense competition. Companies in the targets integrating business possess no unique capabilities, discriminating one from the other; each has the capability to successfully

integrate target reuse inventory (for example, government-furnished equipment components of the Minutemen missile – SR 19, SR 73, M55 and M57). Current utilization rates at target integrating facilities are between 50 percent and 60 percent. The study concluded that only one of the four firms assessed, Coleman Aerospace, is significantly dependent on MDA (96 percent of its business). Any reductions in MDA business during 2003 and 2004 could negatively impact it and cause further cash drain on its parent company, L-3 Communications. The other firms have diversified product lines for both defense and commercial business.

Solid Rocket Motor/Launch System Integrators Assessment (June 2002)

The MDA, with the assistance of DCMA, performed this assessment of the solid rocket motor (SRM)/launch system integrators (LSI) industry sector to evaluate the adequacy of industrial capabilities to meet MDA requirements. The study assessed the industrial capability and financial viability of key defense contractors, both prime and critical sub-contractors. The study concluded that the SRM and LSI industries have substantial overcapacity; sales and employment are decreasing steadily. SRM industrial capacity utilization is averaging less than 50 percent; LSI industrial capacity, less than 40 percent. The SRM industry is characterized as a low-volume one that makes primarily defense products while the LSI workload generally depends on expendable launch vehicles purchased for both the commercial and defense markets. The study identified no domestic source for carbonized rayon fiber. Industry, however, is searching and qualifying possible alternate materials. The MDA used the study to support implementation of an evolutionary acquisition strategy.

Radar Industrial Capability Assessment (October 2002)

The MDA, with the assistance of DCMA, conducted this assessment of the radar industrial base sector, focusing on prime and sub-tier suppliers supporting the MDA radar systems and areas of risk identified in a prior (2000) DCMA assessment. The study placed special emphasis on critical suppliers (sole-source suppliers, suppliers of long-lead items, and foreign suppliers). It provided an integrated assessment of the technology readiness levels of critical technologies that support MDA radar systems and assessed the time necessary to reach appropriate readiness levels. The study concluded that the radar industry supporting MDA is robust. Competition in the sector is adequate even though the number of competitors may shrink due to reduced demand. The MDA used the results of the study in support of a 2002 Defense Acquisition Board review of missile defense and in support of an evolutionary acquisition strategy being implemented by MDA.

5. Programs and Actions to Sustain Capabilities

In 2002, as noted in section 4, DoD took action to sustain essential production capacities in some cases for which DoD peacetime requirements are limited and projected military contingency requirements are significantly larger. In such cases, DoD acquired and/or maintained facilities, equipment, or components needed to meet projected military contingency requirements. Specifically, DoD:

- For certain precision guided munitions, the Department has taken steps to increase production capacity to meet potential contingencies in Southwest Asia.

- For tray pack rations, recognizing that a shortfall in commercial components made peacetime production capabilities insufficient for wartime requirements, awarded contracts to upgrade and maintain government-furnished equipment to increase production output of tray pack rations.

- For pharmaceutical, medical/surgical supplies and medical equipment shortfalls, engaged commercial firms to have sufficient stock available for wartime requirements.

- For nerve agent antidote autoinjectors, continued a support contract to remedy projected surge and sustainment shortfalls during wartime.